

Nomination of
OWEN SUBMACHINE GUN
for an
Engineering Heritage National Marker



Owen Gun Mark 1/42 - skeleton stock, cooling fins on barrel

source gunshows.com.nz



AUSTRALIAN WAR MEMORIAL

RELAWM30622.010

Owen Gun Mark 1/43 - wooden stock, camouflage finish

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Engineering Heritage Sydney
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1. Introduction.

The Owen submachine gun [SMG] ⁽¹⁾ that bears its designer's name was the only weapon of World War 2 used by Australian troops that was wholly designed and manufactured in Australia.

Conceptually designed by Evelyn Owen, a committed young inventor, the concept was further developed to production stage by Gerard Wardell Chief Engineer Lysaght's Newcastle Works Pty Limited - Port Kembla Branch ⁽²⁾ [Lysaghts] with the assistance of Evelyn Owen (and Fred Kunzler a Lysaght employee who had been a gunsmith in his native Switzerland.

This revolutionary small arms weapon was brought into production at just the right time to save many Australian lives in combat in the South-West Pacific theatre of war.

Owen's working model [.22" calibre], was brought to the attention of the Australian Army in early 1939 with a view to the Army developing his ideas of a new machine gun. Owen's idea and gun were summarily rejected by them as they could not believe that a private invention could be superior to a design favored by the British Army and furthermore he was advised that the British Army and consequently the Australian Army did not use submachine guns ^{(3), (4)}.

Many months after having enlisted in the Army. Owen still undeterred, again set out to interest the Army in his gun and in September 1940 demonstrated it to the Army District Inventions Board. He impressed the Board with the possibilities of his invention and was subsequently attached to the AHQ Inventions Board in Melbourne to develop the design of his gun.

On leave before proceeding to Melbourne, fate intervened as Owen's Wollongong neighbor Lysaght Port Kembla Branch Manager Vincent Wardell (Gerard's brother) who was friends with the Director-General of Munitions Essington Lewis, drew Lewis's attention to the potential of Evelyn Owen's design.

At the instigation of the Army and the perseverance of the Wardell brothers, the Owen gun evolved through a number of designs of differing calibres - .38", .32", .45", each with their own problems, until it was conceded by the Army that the calibre of the gun should be the same as for the Sten - 9 x 19mm Parabellum cartridge.

Comparative performance testing of the Owen in its 9mm calibre variant alongside its British Sten and US Thompson SMGs was conducted by the Australian Army. After harsh trials in multiple environments involving sand, mud and water and endurance testing, the Owen was the only weapon that remained serviceable⁽⁶⁾.

The functionality of the Owen allowed it to serve the Australian Army until the mid 1960s

However, the story of the Owen's acceptance by the Army was not as straight forward as one may have thought. It was one of subterfuge and politics. At every turn the Australian Army bureaucracy - in particular, senior officers of the Department of Munitions, Ordnance Production Directorate [OPD], the Master General of the Ordnance [MGO] and Lieutenant General Blamey Commander in Chief of the Australian Military Forces each in their own way, procrastinated and sought to hinder the Owen's production because it was anticipating the adoption of the British Sten SMG, plans for which had been promised by the British government to allow an Australian variant of the Sten SMG - the Austen, to be manufactured in Australia ^{(7), (8)}.

(1) Submachine guns are weapons whose primary purpose is to engage the enemy at short range

(2) Lysaght Newcastle Works - later became John Lysaght [Australia] Ltd and is now a division of BlueScope Steel Pty Ltd.

(3) Britain had not seen the need for a SMG in World War 1 nor in the following years although Germany had developed such a weapon and had successfully used it at the end of WW1 and in the intervening period between the wars. It was only during the evacuation by the British Expeditionary Forces from Dunkirk that the 'brass' realised the extent of their misjudgment.

(4) The Australian Army accepted that British Empire armies should follow the Imperial concept of uniformity of weapons and small arms.

(6) Later comparative testing by the UK, Canadian and US military confirmed the results of the Australian military testing

(7) At Dunkirk the British captured a German MP40 SMG and this was used to develop a British SMG - the Sten.

(8) The extent of the difficulties experienced by the Lysaght team - the Wardell brothers Vincent and Gerard and Evelyn Owen is outlined in Chapter 4 and Appendices 2 and 6

At a glance the Owen looks unconventional. Few guns had been designed to feed from the top, as it would seem to impede the sight plane. However, the Owen solved this predicament by offsetting the sights a bit to the right of the magazine. The 9mm submachine gun was fed by a 32 round magazine and weighed ~ 4.6kg when unloaded and 4.9kg loaded [Mark II variant]. The gun was produced by Lysaghts at its Port Kembla Branch at Springhill, Cringila and went on to serve in the jungle environments of the South-West Pacific during World War 2, on the Korean peninsula in the 1950s, the Malayan insurgence in the 1950s and saw limited use in Viet Nam.

In all, ~46,000 of the guns were produced with the unit cost kept low by the use of stamped components and affordable and available materials. ⁽⁹⁾.

The Owen was also later comparatively tested by both the British [Ref 5 p42] and the US Armies who considered it performed better than the other contemporary SMGs. In 1941 the Canadian military had also shown interest in acquiring the Owen when they had attended the comparative testing in September 1941.[Ref 5 p36].

It is claimed General MacArthur [Ref 5 p207] wanted the Owen to replace the US Thompson as the standard SMG for the US Army.

Comment:

1. The Owen was so successful that it was also ordered by the United States and New Zealand. New Zealanders fighting in the Guadalcanal and Solomon Islands campaigns swapped their Thompson submachine guns for Owens, as they found the Australian weapons to be more reliable.
2. The Owen was later used by Australian troops in the Korean and Viet Nam Wars, particularly by the scouts in infantry sections. The Owen was also used in Malaya by British troops, and was among their favourites for jungle fighting.

Source Albion Park RSL Sub-Branch web site

The Owen, based on the comments of the soldiers who used it, was the best submachine gun used in jungle combat during World War 2.

While its existence was a drawn out struggle between the inventor and manufacturer, and the Australian Army bureaucracy, it went on to see service as the standard SMG with the Australian Army for over 20 years.

Recommended Level of Recognition

Following its assessment against the heritage assessment criteria - Appendix 8, it is considered that the Owen gun was of outstanding engineering heritage significance to the nation. Accordingly, it is recommended that it be recognised at a level that is awarded an **Engineering Heritage National Marker**.

(9) For more historical development information of the Owen SMG refer Appendix 2 History Time-Line of the Owen Gun

2. Nomination Letter

The Learned Body Advisor
Engineering Heritage Australia
Engineers Australia
Engineering House
11 National Circuit
BARTON ACT 2600

Nominated Item: **Owen [Submachine] Gun**

Nominated for: **recognition as an Engineering Heritage National Landmark**

Letters of Support for Nomination:

The Australian Government, the owner of the patent ⁽¹⁰⁾.

Many local organisations noted below have wholeheartedly supported the recognition of the Owen Gun for its engineering heritage significance:

- Wollongong City Council
- Australian War Memorial
- Returned and Services League of Australia NSW - Wollongong Branch
- National Trust [NSW] Illawarra and Shoalhaven
- Illawarra Historical Society
- Port Kembla Military History Museum
- BlueScope Steel Limited [formerly John Lysaght Australia Pty Ltd]

Owners of Examples: **Australian War Museum, Canberra
Lithgow Small Arms Factory Museum, Lithgow
Port Kembla Heritage Park and Military Museum, Port Kembla
various Returned Servicemen's League (RSL) clubs and community
museums**

Nominating Body: **Engineering Heritage Sydney**

Recommended level of Recognition **Engineering Heritage National Marker**

Simon Wiltshier



*Chair
Engineering Heritage Sydney*

Date 19th July 2017

(10) In 1943 Owen applied for and was later granted Patent No 115974 and Patent No 116434 for his gun. In mid 1945 the Australian Government bought the patent from Owen for £2000 and paid royalty payments of £11,250 - £13,260 [\$26,520] in total [with a tax bill of £6,500]. The patent lapsed in 1957

3 Engineering Heritage Assessment

3.1 Basic Data

Item Name: Owen [Submachine] Gun

Former & Other Names: Owen Machine Carbine, the *Diggers Darling*

Location: A full range of the Evelyn Owen concept weapons as developed by Gerard Wardell, is retained at:
Australian War Memorial, Canberra, ACT,
Lithgow Small Arms Factory Museum, Lithgow, NSW
and a limited range of the weapons is at some community museums and RSL clubs around Australia

Owner: The Australian Government was the owner of the patent

Current Use: Museum exhibit.

Former Use: Purpose built offensive jungle fighting weapon

Designer: Concept Design Evelyn Owen
Working Design Gerard Wardell and Freddie Kunzler

Manufacturer: Lysaght Newcastle Works - Port Kembla Branch [later known as John Lysaght [Australia] Pty Limited - Port Kembla Springhill Works] was the manufacturing coordinating contractor for the production of the Owen gun. [a list of the component manufacturers is given in Appendix 5]

Year Started:

Concept design	1931-1939
Working design	1941
Commencement of Manufacture	early 1942

Last Year of Production: 1944

3.2 Physical Description:

Technical Specification: Refer to Section 4 of this document and Appendix 5 for comparison of the Owen with other contemporary SMGs.

The Owen is a select fire open-bolt design submachine gun chambered for 9mm Parabellum rounds which incorporated a number of creative elements that resulted in a proven superior performance in hostile environments compared to all other contemporary SMGs.

Its firing pin is integral to its bolt face.

The Owen utilized a top-mounted magazine and operated on the blowback principle⁽¹¹⁾, which gave several benefits. The staggered double column magazine arrangement with alternating feed allowed gravity to assist both feeding and ejection [however, the Owen could function when held upside-down and sideways]. Since the ejection port was on the bottom of the receiver, which was tubular shaped, dirt which may have entered from the magazine or through the magazine well would fall through, having no place to collect.

The Owen used a two-chamber receiver. The bolt cycled in the front chamber [with a relatively short travel], and the charging handle was located in a separate chamber in the rear of the receiver. Only a small hole between the two allowed the charging handle to connect to the recoil spring guide. As a result, dirt entering through the charging handle slot was confined to the rear section, where it could not do much to impede the gun's function. There was no way dirt could get behind the bolt where it was most apt to cause problems.

(11) see definition Appendix 7

Another unique feature of the Owen Gun is the ejector. Other SMGs and Owen's early variants relied on interference between the base ring of the cartridge in the breech with that of the cartridge in the magazine to eject the spent cartridge shell. The base ring of the cartridge being ejected was supposed to strike the base ring of the next cartridge as it was withdrawn from the breech and eject from the gun. This proved to be an unreliable system.

To overcome this problem Gerard Wardell modified the rear wall of the magazine to include a 'tooth' which would act as the ejector. This was unique among SMGs and was a significant point in Owen Patents.

Another benefit from incorporating the ejector mechanism in the magazine was that if the ejector was faulty, the problem could be overcome by simply replacing the magazine.

(Image removed)

Top – Owen Mark I-1942 with camouflage paint, steel skeleton stock, and finned barrel
Center – Lithgow Small Arms Factory rebuilt Owen with Parkerized finish, plain light barrel, rotary safety sleeve and wood stock
Bottom – Austen SMG

Because of this design, disassembly was done from the front – unlike most open bolt SMGs. The barrel was held in place by a simple latch located at the front of the receiver, ahead of the magazine housing and was easily removed by pulling up on the barrel pin at the front of the receiver. The rear end of the barrel and the front of the receiver tube were both match-machined with tapers; thus the barrel was easily seated. Once the barrel was removed, the bolt and recoil spring slid out the front of the tube. In most guns this was obstructed by the ejector but in the Owen the ejector was made part of the magazine rather than being integral with the gun itself. As the bolt extracted a fired case it held the ammunition in the magazine down (actually up, given the top-feed arrangement). After enough rearward travel the rim of the empty case hit the ejector tab at the rear of the magazine, which tipped it out of the extractor to drop free of the gun. Pressure from the next round in the magazine now pushed directly on the empty case and provided an additional ejection force.

The muzzle was equipped with a recoil compensator.

The pistol grips were made from bakelite plastic.

The detachable butt/stock was a steel strip skeleton frame on the Mk.1-42 Owens and from wood on later models *refer above photo*.

On first sight the Owen looks a clumsy gun, weighing 4.7 to 4.9kg loaded with a full magazine [depending on the model]. The built-in compensator at the muzzle helped to keep the gun controllable. The safety and magazine catch were both simple and effective [although the original fire selector apparently had a tendency to allow bursts when in semi-auto mode]. To allow for the top-mounted magazine, the sights which were not adjustable, were offset to the right side of the gun – not a problem for the right-handed, but a bit of a handicap for the left handed.

Some of the Owens were fitted with bayonet mounting brackets on the barrel to take an expressly designed bayonet.

Legacy

The Owen was taken out of production in 1944, with 45,433 guns having been manufactured. The Owen saw use in Korea, the Malayan insurgence and in Viet Nam until the middle of the 1960s. The Owen was well liked by the troops. The gun was an effective weapon, accurate at 100m, able to operate in the harshest of environments and able to withstand rough treatment.

They remained in Australian service until replaced by the F1 SMG in 1964. Not surprisingly the F1 design retained the Owen's top mounted magazine position [but it took other features from the British Patchett Sterling SMG].

Manufacture

The Owen Gun was relatively cheap to manufacture – about the same cost as the Austen, cheaper than the imported Thompson but more expensive than the Sten – see Table in Appendix 3].

The Lysaght Newcastle Works - Port Kembla Branch began the Owen gun project as a patriotic endeavor to help ensure Australia's survival through the war. Its stated intention was to develop the weapon to a stage where it could be successfully mass produced by others. Until the first major order for 100 trial guns in April 1941, Lysaghts funded all the development and prototype construction and did not ask for reimbursement from the Australian government.

Understandably, when Lysaghts were of the view that the Army was intent on not allowing the Owen to be manufactured, it moved to produce the weapon at a purpose-built facility at its Springhill Works and chose to act in the role of a coordinating contractor - where components were made by other firms and brought to Port Kembla for checking, rectification - if required, assembly, testing and delivery to the Army.

3.3 Historical Notes: *Refer to Appendix 2 of this nomination document for dates and details.*

3.4 Heritage Listings: None



4. Why Was the Owen SMG Superior to Other SMGs

based on Ref 5

The term '*submachine gun*' [*'machine pistol'* in USA and Germany, and '*machine carbine*' in Britain], describes a gun that fires pistol ammunition and is light enough to be used two-handed from the shoulder or the hip without other support. It is capable of providing 'automatic' or 'repetition' fire and in some cases single fire. The gun is intended to deliver a large volume of fire effective at short range only

At the beginning of World War 2 the SMG was not a new weapon. SMGs were used to some extent in World War 1 by the German Army.

Relatively cheap to manufacture and simple in operation the SMGs placed an automatic weapon into the hands of infantry greatly increasing their short-range firepower, especially when their main weapon at the time was a bolt-action rifle capable of only around 15 rounds per minute and unsuited for short-range combat.

The essence of the Owen SMG's reliability was its simple design. It was well designed and engineered, with little more than a barrel a bolt and a spring. [A case of compatible form and function]

The Owen gun's greatest strength [in regard to reliability in difficult environments such as muddy or sandy situations], was that the chamber within which the spring and bolt head oscillated back and forth, was sealed from the exterior environment; other SMGs such as the Thompson M1, M3, Sten, Austen and MP40 did not have these features. Contemporary overseas designs such as the Sten and Thompson had a slot in the body for the cocking handle that gave dirt easy internal access and so obstruct the moving parts. In the Owen, cocking was achieved within a rearward extension of the body which was sealed from the section that contained the bolt head and spring.

The Owen's positioning of the magazine on top with bottom ejection of the spent round, helped reduce the chance of debris fouling the chamber, as each ejected round tended to carry any accumulated waste out via the ejection hole. The ejecting round also prevented debris from entering the firing chamber from below.

Other innovative concepts that were incorporated into the design of the Owen were:

- A large circumferential groove was machined close to each end of the bolt; its purpose being to accommodate any dirt that was scraped off the surface of any moving parts and to later dispose of it through the ejection hole.
- A clearance was provided between the bolt head and the barrel when there was a cartridge in the breech to allow the gun to fire if dirt entered the firing chamber.
- The firing pin was an integral part of the bolt, not a moving component within the bolt as was the case in some other SMGs. This allowed the full inertia of the bolt to be directed at firing the next round under dirty conditions.
- The head of the bolt was deeply recessed so that the firing pin could not reach the cartridge cap unless the cartridge was aligned with the firing chamber. Therefore, when the round was fed from the magazine, its nose had to be well inside the firing chamber before proper alignment could occur - thus minimising premature explosions.
- The main spring was fully guided, acting around a cylinder and was, therefore, not subject to significant vibration stresses.
- The trigger mechanism was robust, controlled by short springs which did not oscillate as the bolt passed back and forth; it was therefore, very reliable. The gun could not "run away" [i.e. fire "automatically" when set on "*single shot*"] because of the fire control structure. The whole trigger mechanism was packed with corrosion-resistant grease.

- The rear face of the magazine acted as an ejector tipping the spent cartridge downward as the bolt moved to the rear. This was a very reliable system. In the event of a broken ejector [a common fault with SMGs] cure was effected by simply changing the magazine.
- The Owen had no sliding surfaces under heavy load. The entire thrust from the firing of a round was in the axial plane, transmitted through the recoiling parts to the main spring without having to be carried by any sliding or rotating surfaces [as was the case in the Thompson with its 'H piece']. This greatly enhanced the working life of the Owen.
- The Owen was very easy to disassemble for field cleaning and packing. The barrel was designed for quick removal, being held by a simple catch in front of the magazine. Releasing this catch allowed the barrel and the fore-grip to be removed allowing the bolt and spring to be extracted from the front of the body.
- The butt stock was simply removed by pressing a spring-held catch and similarly, the magazine was very easy to remove. The whole process of disassembly took about 8 seconds and reassembly could be effected in about 15 seconds.
- With its two hand grips and the vertical magazine the Owen "felt good" - it was easy to manoeuvre [essential in the work it was designed for] and the vertical magazine allowed for an agreeable centre of gravity as well as being less likely to be caught in undergrowth than a side or under magazine.
- The trigger group - made to Fred Kunzler's design, was designed such that each movement of the selector allowed more movement of the trigger. The trigger was blocked in 'safe', had partial movement in 'semi' [which tripped the sear] and full movement [which held the sear out of engagement with the bolt] in 'automatic' fire. The full 'auto' position was all that was really needed to fire the gun. The gun was designed so that it would still fire on 'auto' if one of the three springs used in the trigger assembly were broken or lost. The spring that came out the easiest was the flat steel trigger return spring [the others were coil springs]. If this spring was missing or improperly installed the gun would still be capable of firing, but on 'auto' only.
- The Owen magazine - made to Gerard Wardell's design, was a staggered double column arrangement with double feed unlike its contemporary SMGs [with the exception of the Thompson which had other shortcomings].

In comparison with other SMGs,

- the magazine could be filled without the necessity of the use of a special tool
- the top mounted magazine allowed easy firing when the soldier was in a prone position.
- the top loading magazine and catch design allowed for faster magazine changes
- the loading arrangement adopted provided more reliable feeding

The wording of the patent - number 115,974 [lodged in 26 March 1942 and granted on 18 February 1943] describes the extraction of a round thus:

In the initial stage of the return stroke of the breech bolt the empty cartridge case is held by the hooked portion of the extractor until a projection on the magazine, which is adapted to project into the groove in the breech bolt in its forward position, engages the head of the empty cartridge case, spins the cartridge case downwardly and outwardly through the ejection slot in the body

- The Owen's muzzle rise was minimal [in comparison with other SMGs] and emptying a magazine in one burst was controllable due in part to the gun's weight and its dual grip design.

All these features made the Owen gun with its magazine, a reliable weapon completely suited for its intended purpose in a hostile environment.

5. Engineering Heritage Assessment

5.1 Historic Phase:

The Owen Gun is historically significant because :

- it was the only munition designed and developed wholly in Australia
- it became the best SMG in the Allies' arsenal of armaments
- it became the first Australian firearm to be mass produced in Australia
- it was successfully used in 'forward area' service in a number of theatres of war from the 1940s up to the early 1960s
- following rigorous controlled range testing in both the UK and the US, the respective military officers who witnessed the testing thought highly of the weapon's ability.

5.2 Historic Individuals or Association:

The Owen Gun is significant because of its association with:

- Evelyn Owen
- Essington Lewis
- The unsung developer of the Owen, Gerard Wardell
- John Lysaght [Australia] Pty Limited
- The soldiers that were casualties because the prejudicial senior officers in the Army were reluctant to issue the Owen for forward area service in the south-west Pacific

5.3 Creative or Technical Achievement:

The Owen Gun is significant in this area because:

- it proved to be significantly superior to other contemporary SMGs in controlled range testing and in service
- under controlled range testing and at the front it was capable of greater accuracy and grouping of shots in comparison to other SMGs
- it was functional, robust, reliable and required little training to effectively use
- its simplicity of design and construction enabled it to function successfully under difficult service conditions.
- the problems that led to failure by other SMGs in theatres of war - dirt, mud, jamming were not a problem with the Owen
- the simplicity of its modular construction allowed the rapid dismantling and easy replacement of components. [It could be disassembled and reassembled in less than 1 minute]
- it demonstrated Australia could develop desirable weapons
- its magazine was easier to load than those of its competitors
- with its top-loading, top-feeding magazine, in close combat it allowed the user to maintain a minimal profile staying blended into the background and surrounding terrain while still being able to manipulate and fire the weapon accurately
- its system of fire control facilitated economical expenditure of ammunition
- it had a relatively high muzzle velocity which helped to make the gun a very effective short range weapon

5.4 Research Potential:

The Owen Gun has high research potential:

- through its design and manufacturing technology.
- for the framing of policies and procedures for the evaluation of new weaponry
- As an object lesson on how the Army, prejudiced against local design, placed at risk its own soldiers and its campaign by hampering the introduction of a weapon superior to those in current use.

5.5 Social:

The Owen Gun is significant from a social perspective because:

- the Owen was well liked by soldiers due to its robustness, reliability and simplicity.
- it was a significant factor in Australia's successful actions in the Pacific in World War 2
- as a result of the Owen being issued to Australian forces, it was a great credit to the Lysaght team that the Owen triumphed over its political opposition

- many of the Australian soldiers who had used the Owen came back to personally thank the Lysaght team as they believed the Owen had saved their lives and the lives of their fellow soldiers.

5.6 Aesthetic

The *Owen Gun* is of aesthetic significance because:

- in the public mind [assisted by the press of the day and letters home] it was the personification of the embattled outnumbered Australian soldier fighting the Japanese in the Southwest Pacific, in particular the New Guinea jungles.

5.7 Representativeness:

The Owen Gun is of representative significance because:

- it was a fine weapon and was chosen ahead of other SMGs for close combat fighting in jungle warfare.
- in April 1943 it was declared "The Standard Submachine Gun for the Australian Army"
- it provides evidence of a weapon that played a significant role in successful operations in the Pacific war.

5.8 Rarity:

The *Owen Gun* does not have rarity value as there are quite a number in existence.

5.9 Other Points of Significance:

Other facts relative to the level of recognition for the *Owen Gun* are:

- Captured guns were used by Viet Cong forces [in small numbers] and by the Japanese in New Guinea [again in small numbers].
- US forces' borrowed' Owens in New Guinea and Korea preferring them to their own issue SMG

5.10 Statement of Significance:

The Owen Gun was an Australian-designed and manufactured submachine gun (SMG) that was superior to other SMGs used by allied forces in the Pacific war; it was accurate, robust, reliable, effective in dirty and muddy conditions, it was relatively cheap to manufacture, and its effective use required little training. Its superiority was such that it remained in service for 20 years through the Pacific War, the Korean War, the Malayan Emergency and the Viet Nam War.

The gun contributed significantly to reduction of casualties and to the defeat of the Japanese army in the Pacific War.

The concept design of the gun was by a young inventor Evelyn Owen and was developed to production stage by Gerard Wardell and Fred Kunzler of John Lysaght [Australia] Pty Ltd. Its production and adoption by the Australian army was largely at the instigation of the Federal Government Ministers for the Army and Member of the War Cabinet, Percy Spender [1940-41] and Frank Forde [1941-45], and the persistence of Gerard Wardell and Essington Lewis, Director-General of Munitions.

The concept design of the gun was by a young inventor Evelyn Owen and was developed to production stage by Gerard Wardell and Fred Kunzler of John Lysaght [Australia] Pty Ltd. Its production and adoption by the Australian Army was largely at the instigation of the two Federal Government Ministers for the Army of the day Percy Spender [1940-41] and Francis Forde [1941-45]. and the persistence of Vincent Wardell and Essington Lewis, Director-General of Munitions.

There are opportunities for research in considering the design elements that contributed to the gun's success, and lesson to be learnt for the framing of policies and procedures for the evaluation of new weaponry, from the opposition that existed to adoption of the Owen Gun by influential people, and in their deference to the SMGs of the UK and USA.

5.11 Comparisons:

Contemporary submachine guns were:

USA	Thompson M1A1
USA	General Motors MP3
Britain	Sten
Britain	Stirling
Australia	Austen - an Australian version of the Sten submachine gun
Germany	Burgman [<i>Schmeisser</i>] MP40
Germany	StG 44
Japan	Type 100

5.12 Recommended Category of Award: Engineering Heritage National Marker

6. Interpretation Plan

It is proposed that the interpretive panel - perhaps more than one, will be erected in the public car park of BlueScope Steel Coated Products at Port Kembla, the site of the former John Lysaght [Australia] Pty Limited - Port Kembla Springhill Works, the developer and manufacturer of the Owen Gun.

An interpretation plan including design of the panel will be developed in consultation with BlueScope Steel.

7. References & Acknowledgements:

This nomination document used information from the following documents:

	Author	Title	Publisher	Repository/ location	Year
1	G.S. Wardell	The Development and Manufacture of the Owen Gun	ISBN 0959217002 Alan Stein	Port Kembla Military Museum	1982
2	G.S. Wardell	The Owen Gun - Analysis and Notes on Design	ISBN 0 9592170 2 9 Alan Stein	Port Kembla Military Museum	1983
3	C. Morton	The Evo Owen Story	ISBN 0 9751715 3 4	Personal copy	2007
4	Alan Stein	The Owen Gun - Chronological Bibliography and Catalogue of Memorabilia and Published documents		http://www.edu.au/-morgan/owen2.htm	2008
5	Kevin Smith	The Owen Gun Files - an Australian Wartime Controversy	Turton & Armstrong Pty Ltd 21 Lister St Wairoa 2076		
7	Wayne Wardman	The Owen Gun	ISBN 0 731 6 0365 6 W Wardman PO Box 101 Curtin ACT 2605		1991
8	Dr Andrew Ross	Facts, Decisions and Strategies in the Background of the Development and Manufacture of the Owen Gun	The Arming of Australia: The politics and administration of Australia's self containment strategy for munitions supply, 1901-1945 Fulfilment of requirement for PHD thesis UNSW -Australian Military Academy Canberra		1986
9	James O Bardwell	Machine Gun News	www.titleii.com/bardwell/owen_gun.txt		April 1995
10	R G Laycock, A Ross	The Australian Owen Gun Scandal, 1940-45	War in Society- Volume 3, No 2 UNSW		Sept 1987

Web Sites

In preparing the nomination the following web sites were accessed:

<http://www.thefirearmblog.com/blog/2013/02/03/made-in-australia-the-owen-submachine-gun/#sthash.np7qi8Np.dpuf>

Acknowledgements:

My research on the Owen Gun has benefited from the extensive experience of curator of Military Heraldry and Technology Mike Etzel from the Australian War Museum, Brian Maloney from the Lithgow Small Arms Factory Museum and Chris Cullen to whom I owe a great debt of thanks.

I have also drawn on the knowledge and wording of G. S. Wardell 's two monographs Refs 1 and 2 and Wayne Wardman's book Ref 7 and websites.

Appendix 1 Letters Supporting the Recognition of the Owen Gun

The following organisations have given their support to the recognition of the engineering heritage significance of the Owen Gun by Engineering Heritage Australia:

Wollongong City Council

Australian War Memorial

Returned and Services League of Australia - NSW Branch - Wollongong Sub-Branch

National Trust [NSW] Illawarra and Shoalhaven

Illawarra Historical Society

Port Kembla Military History Museum

BlueScope Steel [formerly John Lysaght Australia Pty Ltd]

Illawarra Military Heritage Society [Port Kembla Breakwater Battery Military Museum]

Senator the Hon Marise Payne, Minister for Defence.

Appendix 2 History Time Line of the Owen Gun

Date	Occurrence	Comment
1915	German army converted its model 08 Maxim guns by removing the tripod and fitting a wooden butt and pistol grip	
1916	The first significant SMG was designed in Germany In Bergmann factories - Machine pistol 18	Design work by Hugo Schmeisser Used in WW1
Mid 20s	Schmeisser improved on his design	
15 May 1915	Evelyn Owen born	
1928	First Thompson SMGs purchased by US Army	developed in 1919
Late 1930s	Owen began working on a .SMG using 22 calibre rimfire ammunition	
Mid 1938	MP38 adopted by German Army	M40 used economical and speedy manufacturing methods
July 1939	Owen and his father took the prototype gun to Victoria Barracks Sydney, discussed the mechanism with Col. Wright and was told the Australian Army was not interested	Australian Army accepted that British designed weapons and munitions were the best in the world
1 Sept 1939	Germany invades Poland	
15 Sept 1939	Australia establishes a War Cabinet	
May 1940	Essington Lewis accepts the position of head of the Department of Munitions	
26 May 1940	Dunkirk evacuated	British [and Australian] attitude towards the need for SMGs changed. Large orders for US Thompson placed. Britain decides to develop a SMG of its own
28 May 1940	Owen enlists in 2/17 Battalion of the AIF	
June 1940	Department of Munitions established	
Mid Sept 1940	Vincent Wardell "finds" Owen's .22 prototype and discussed it with Owen and wrote to Essington Lewis	Lewis had recently been appointed as Director General of Munitions by the government
20 Sept 1940	Essington Lewis arranged for Owen to be transferred to the newly created Department of Defence Coordination Central Inventions Board [CIB] to allow further work on the development of the Owen gun to proceed	
		MGO Branch of the Army condemned the Owen SMG as being too costly and told Owen it would take six months to make a working model
24 Sept 1940	Owen demonstrated his .22" calibre gun to a non committal Director of Artillery Col. Meredith	
14 Nov 1940	.22" calibre gun was handed back to the Central Inventions Board by Director of Artillery. Secretary of Board Captain Dyer was greatly impressed	The Army had revised its opinion and now SMGs were an acceptable weapon
Mid Dec	Owen's ideas incorporated into drawings made by Ordnance Section but with considerable changes Final drawings sent to appropriate military authorities	Principal Ordnance Engineer considered that a gun made to these drawings would not work and suggested further modifications. He advised to make the gun would take a minimum of 6 months
	Secretary of Central Inventions Board Dyer sought permission to have Lysaghts make a mock-up model made. Denied	Denied because Army Regulations stated that all such work should be done by Ordnance
	Dyer privately contacted V Wardell and asked him to make a test model in .38 calibre. Wardell agreed	Consequently Owen was seconded from the Army to continue work on developing the gun with the assistance of Lysaghts
16 Dec 1940	Army suggested the gun be made as .32 calibre ammunition Owen was directed by Captain Dyer of Central Inventions Board duty return to Wollongong and work with G Wardell Lysaghts Chief Engineer to create a working model that was also easy and cheap to manufacture.	Army admitted it could not supply either a barrel or ammunition. V Wardell rang around and obtained .32 calibre ammunition. Found .303 army rifle barrel accepted .32 bullets.

Mid Jan 1941	Manufacture of a .32 calibre model exactly to Owen's drawings was complete with new trigger mechanism design by Kunzler but the gun had cross feed and ejection problems	Side mounted single row magazine
Jan 1941	Reports were coming from overseas/ Africa saying the Thompson was jamming badly in sand in Africa	
Jan 1941	First successful testing of the new Sten in the UK - based on German MP40 obtained from Dunkirk	
Jan 1941	Owen approached G Wardell for further assistance.	
Jan 1941	G Wardell made important changes to the gun's design which solved the cross-feed and ejection problems by modifying the magazine so that its rear wall would act as an ejector With the trigger and magazine modifications trials at Lysaghts range at 200 yards were most encouraging	These changes made the gun fire consistently and they were to remain standard on ensuing Owen models.
28 Jan 1941	[Second model gun] 32" calibre demonstrated to the Central Inventions Board Dyer was impressed but Ordnance Production Dept [OPD] was not	MGO advised that to prove its worth the Owen needed to test fire 10,000 rounds without problems [but was unable to supply any ammunition for the testing] for it to be considered by the Army
Jan 1941	Dyer of Inventions Board suggested Owen/ Lysaghts should now make a .45" calibre model the same as that used by the Thompson. Lysaghts accepts the challenge.	Army had placed orders for Thompsons. Lysaghts attempted to anticipate the Army's ultimate ammunition choice by also manufacturing a .45" model of the Owen SMG.
	The Army assured Lysaghts it would have sufficient supplies of .45" ammunition when the gun was completed.	When it arrived it was found to be .455" semi-rimmed Webley Scott ammunition Lysaghts then manufactured a second barrel to suit .455 ammunition
Jan 1941	British Sten gun adopted as standard submachine gun for British Army after recent tests	
30 Jan 1941	Owen and V Wardell prepare a report for AHQ Central Inventions Board outlining the design features for the Second Model Owen returns to Lysaghts with two major requests for modification of his gun - use of .45 ACP cartridge as Thompson SMG - change in configuration of magazine to move to top positioning and double feed	Wardell presented notes highlighting - ease of manufacture, simplicity, rapidity of dismantling, no sliding surfaces operating under heavy loads and reliability This was the configuration that established the basic arrangement for all future models
Feb 1941	In response to a British request for replacement arms lost at Dunkirk Australia had denuded its stocks of rifles	
2 Mar 1941	Australian Army orders 6000 Thompsons from the US	Manufacture of the Thompson involved complicated machining and as a consequence was expensive to produce
17 Mar 1941	Lysaghts conducted tests [with 6 cartridges] of .45" calibre model - successfully test fired	
March 1941	Lysaghts had redesigned and built a gun for the .455 semi rimmed ammunition and successfully tested it after a few modifications.	
17 Mar 1941	V Wardell wrote to Milford, Master General of Ordnance (MGO) informing him of the gun's performance and asking where to now	Milford did not reply
30 Mar 1941	Minister for Army Percy Spender learns of the Owen	Not from the Army. The Thompsons and unknown Sten were yet to arrive in Australia
31 Mar 1941	After MGO had ignored a letter from V Wardell Vincent wrote to Essington Lewis to update him on unacceptable progress	Highlighted problems being caused by the Army
	More letters to Owen from his brothers stationed in the Middle East urging him to speed up production of his gun	
1 Apr 1941	Percy Spender Minister for the Army sought knowledge of the Owen which the Army had failed to brief him on and invites Vincent and Evelyn to Canberra so he can familiarise himself with the Owen. Spender is impressed.	Wardell and Owen take the .32" Model 2 and .45" Model 3 prototypes
9 April 1941	Percy Spender Minister for the Army invites Vincent Wardell and Owen to attend a War Cabinet meeting. to	Spender had found out about the existence of the Owen gun which the Army

	<p>explain the invention. War Cabinet shown Owen guns by Vincent Wardell and Evelyn Owen War Cabinet agrees an order for 100 Owen guns should be placed "without delay". <i>This decision was seen by the Army as infringing the hitherto sacrosanct principle that the army alone should decide what weapons it should have.</i></p>	<p>had not told him represented an alternative to awaiting the arrival of the costly Thompson The calibre of the gun to be determined by the Chief of General Staff</p>
Apr 1941	No ammunition available so further testing and development of .45" Owen was suspended	Reports of Thompsons and ammunition being in the hands of the Australian Army for training purposes
18 Apr 1941	Dyer suggested to his superiors that Lysaghts be asked to make an Owen that could fire the same ammunition as the Sten - 9mm so that comparative tests can be made with the Sten	Suggestion turned down by MGO and Dyer castigated
Apr 1941	At a meeting of V Wardell and the MGO and others, Major General Milford directs all experimental guns be made in .38" calibre rimmed pistol ammunition and that he was not interested in the .32" or .45" calibre guns	Milford stated nothing could be proved about Owen with less than 12 months testing. Wardell writes in his diary ... I have met nothing but obstruction from the Army [over the past 5 months] and in that time had no official communication from them.
Apr 1941	Major General Milford insisted the Owen ammunition be .38 rimmed pistol ammunition and claimed that 12 months would be required to prove the Owen. At this time he outlined the acceptance tests the Owen would have to perform including sand and dirt	He refused Wardell's request for an Army expert to work alongside the Lysaght team. Milford used this tactic to thwart the Owen on technical grounds
Apr 1941	MGO stated he was expecting the Sten at any time and this gun had over a year's testing	The gun had made its first appearance in Britain in January
Apr 1941	Wardell's request that an Army expert should be provided to work in parallel with Lysaghts in producing a model acceptable to the Army was rejected as out of hand	
Apr 1941	V Wardell arranges Owens transfer back to Melbourne along with drawings of the .38" gun	So as to enable the MGO to give definite instructions regarding the .38" gun
Apr 1941	Lysaghts establishes the Owen Gun Annex	
Apr 1941	Spender advised the War Cabinet to direct the Army to place an order for 100 guns	
21 Apr 1941	Lysaght Port Kembla Annex and firing range for the assembly and testing of the Owen built	83 women and 30 men employed
24 Apr 1941	War Cabinet approved an experimental order of 100 test guns	The question of any further developments of the gun to be determined by the rate of production and the results achieved. The calibre of the 100 guns to be determined by the Chief of the General Staff
	Milford insisted that the barrels be made to use .38" rimmed ammunition. Army advised that two .38" calibre barrels had been ordered in Dec 1940. Wardell sought advice from the advised manufacturer who advised that he had no order for the work. Later in April the Army promised Lysaghts that 10,000 rounds of .38" ammunition was on order from overseas	Army was aware that no machine gun had yet been manufactured to fire rimmed ammunition successfully because of difficulties associated with interleaving the bases of rimmed cartridges, saw a possibility of thwarting the Owen gun going into production by being unable to overcome this design problem .
April 1941	NSW Police Criminal Investigation Branch supplies a barrel for the .38" with 8 cartridges	This was from a cut down 9mm Luger pistol. Wardell cleverly designs a banana shaped magazine to overcome the rimmed problem. All done in just 5 weeks
	G Wardell designs the .38 Owen using Evelyn Owen's .45" layout and the magazine on top improving the trigger layout.	The Owen-Kunzler- Wardell configuration became the standard on all future Owens
26 Apr 1941	A report went from MGO to Spender praising the new Sten gun designed by British Ordnance, and at the same time criticising the Owen	No one in the Australian Army or Military Board had at the time seen the Sten gun or had seen it fired.
10 May 1941	.38" Owen gun manufactured at Lysaghts Port Kembla Works	
10 May 1941	Labor government elected	
28 May 1941	MGO advises Lysaghts an order for 100 guns to fire .38" pistol ammunition is being placed immediately	"This order is purely experimental and in no way should be regarded as a commitment to further quantities"
30 May 1941	PM announces Australian troops would shortly be equipped with an Australian designed and built Tommy gun [Austen]	Australian Sten - the Austen
June 1941	British Sten goes into production	

June 1941	Strongly biased report with incorrect statements [later proven false] prepared by Army	
June 1941	Unbeknown to Lysaghts Army instructs a draftsman to redesign the Owen gun	6 major and 14 minor points of concern - all refuted by V Wardell
16 Jun 1941	Actual order placed by the Army Ordnance Production Department	Subcontractor for barrels nominated by Dept of Munitions as the Howard Auto Cultivator Company
	Delays in delivery by Howard caused by inability of government to supply required machinery	
24 Jun 1941	Lysaghts submitted their .38" Owen to a significant in-house test after immersing in saltwater and mud. It fired without difficulty	Reports had come from Syria that Thompsons had failed after they been immersed in salt water
11 July 41	Maj Roberts writes an unfavourable report following witnessing tests of .32" and .38" tests at Lysaghts	
22 Jul 1941	Patent Application No 2237 for Improvements Relating to Firearms	Based on .38 model but subsequently amended for 9mm Patent No 115974 issued 2 Oct 1942
26 Jul 41	Lysaghts advised no further tests of .32" Owen required	Army refuses to supply ammunition
30 July 1941	First supply of Australian made .38" ammunition arrived	This gave the first opportunity to fill a magazine
Aug 1941	Tests on .38" ammunition showed low muzzle velocity. Lysaghts revert to .45 ammunition	Affected gun's accuracy especially with cross winds. Milford knew/ should have known this would be the case
11 Aug 1941	Promised delivery of .45"calibre ammunition arrives at Lysaghts	5 months later than promised
11 Aug 1941	V Wardell notes barrels delivered unsatisfactory	
13 Aug 1941	British War Office despatched Mk 1 Sten arrives in Australia with drawings	
	With Spenders agreement the order calibre was switched to .45"	
22 Aug 1941	First .38" calibre gun completed by Lysaghts	
Aug 1941	Lysaght obtained Minister Spender's approval to switch the 100 gun order to .45" ammunition.	Lysaghts attempts to mind-read the Army - ammunition that is compatible with Thompson
Sept 1941	Canadian Army shows interest after Long Bay demonstration	
Sept 1941	Lysaght makes two more .45"calibre with further changes	Redesigned firing pin making it an integral part of the bolt
4 Sep 1941	Footscray muzzle velocity tests of Owen in .32", .38" and .45" calibre. Gerard Wardell sees 9mm Sten ammunition for the first time and realises its superiority over ammunition used in the Owen to date and purloins 9mm ammunition.	Tests showed Owen shooting excellently with velocities obtained higher than the rated velocities from similar calibre pistols.
6 Sep 19 41	V Wardell again writes to Lewis highlighting the Army's procrastination	
7 Sept 1941	Lysaghts start design of 9mm gun	
7 Sep 1941	Spender agrees to again change the calibre of the experimental guns to 9mm	
Sept/ Oct 41	Lysaghts redesign the .38 [9.64mm] calibre gun to use 9mm cartridge and makes three test guns in 21 days using components intended for the .38 calibre Experimental order	Wardell tells OPD failure to specify 9mm delayed production by 6 months
17 Sep 19 41	OPD held a meeting in preparation for a conference to be held next day.	In June the OPD had asked one of their draftsmen to redesign the Owen
18 Sep 1941	Conference with Army Inspection Branch, OPD, Die Casters and Gerard Wardell called to review the first of the experimental .38 calibre order. Effectively the Army called for a complete redesign	OPD issued a 56 point criticism of the Owen. It was obvious the OPD wanted to take over the gun and redesign it themselves. [It had accepted the Thompson and Sten without changes]. The OPD was ignorant of the development of the 9mm model
22 Sep 41	V Wardell writes to Spender refuting/ correcting nearly all of Major Roberts 68 point criticism	Response to July witness tests
29 Sep 41	By this date Lysaghts had made three working 9mm models	
29 Sep 41	Comparative testing of Owen, Sten, Thompson witnessed by the Minister for the Army Long Bay Sydney. Accuracy with single and automatic fire combined with magazine changing, handiness in engaging opportunity targets and mechanical functioning under adverse conditions.	Owen demonstrated in .45" and 9mm format. G Wardell did most of the shooting. Sten failed badly in dirty conditions as did the Thompson.
29 Sep 1941	Minister Spender observes "there still appears to be marked hostility verging on obstruction in respect to all	Tests included - accuracy [with single and automatic fire combined with

	matters concerning the Owen gun" as a result trials of the newly arrived Sten, Thompson and Owen guns were conducted at Long Bay Rifle Range involving water, sand and mud. Spender attended the trials and fired the Owen.	magazine changing], handiness in engaging 'opportunity targets' and 'mechanical functioning under adverse conditions". Owen continued to function through all tests; the others did not.
	Every one of the senior officers were greatly impressed except Milford	Milford continued with his opposition
30 Sep 41	The three SMGs had a 6-day test including accuracy trials and endurance testing involving continuous firing of 2700 rounds. As a result of the trials Spender increases the order for the Owen from 100 to 2000	Sten withdrawn - failures
Early Oct	Milford writes to Spender praising the Owen's performance but also notes that prolonged firing trials would be required before consideration could be given of the guns acceptance by the Army	
2 Oct 1941	Vincent Wardell wrote to Lewis regarding resistance by the Army to the introduction of the Owen	
	Major Howe reported to his Minister that the Owen should be adopted for issue to the AIF	
3 Oct 1941	Government fell. Minister Spender directs that an order be placed immediately with Dept of Munitions for 2000 guns to enable planning to be taken to get the manufacture of the gun into immediate production	
7 Oct 1941	Change of Government. New Army Minister is Mr Forde	
8 Oct 1941	User trials at Randwick - 9mm and .45 calibre Owen against English Sten 9mm Mark I and American Thompson .45"guns.	6-day assessment including accuracy trials and endurance testing - 2700 rounds. Again the Owen proved superior to the others; the Sten broke down after firing 824 rounds yet the MGO reported unfavourably on the Owen.
14 Oct 1941	Army conference at Randwick calls for modification of Owen gun - meeting MGO, OPD Lithgow Small Arms Factory Army, Munitions and Lysaghts to discuss items brought to light as a result of the endurance tests. Gerrard Wardell could not attend because of short notice.	Director of Artillery minutes agreement was reached on a number of minor modifications to eliminate the problems that had come to notice during the endurance trails and introduced four items that involved substantial changes to the design <ul style="list-style-type: none"> - fixed barrel rear stripping - Changes to the position of the cocking handle - Consequent movement of the back-sight to the LHS of the body - Introduction of a removable framed butt Inspection Branch and OPD had effectively redesigned the gun
23 Oct 1941	Meeting called in Melbourne supposedly to reach agreement on the drawings which had been prepared by the OPD for both the modified gun as tested and the Army/OPD design	Minutes of this meeting could not be located Because of short notice Vincent Wardell chose not to attend
24 Oct 1941	Canadian Trade Commissioner requested information regarding the Owen gun and a sample gun and specifications were sent to Canadian Government on 29th November	
24 Oct 1941	A representative of Ordnance Production Directorate came to Lysaghts carrying gun production drawings full of alterations. They were effectively a complete redesign of the gun	Owen and the Wardells told him the changes would not work. He promised to report on his return to Melbourne but did not.
26 Oct 1941	V Wardell meets with the new Minister for the Army Frank Forde and reported on the present position with the Owen gun	Vincent Wardell leaves a copy of Notes on the Development of the Owen Gun and followed this up with an extended version on the 28th
29 Oct 1941	Minister Forde endorses Minister Spender's increase of order on Lysaghts for order of 2000 Owen guns and gave clear instructions for the Army among other things to concentrate on the production of the Owen	Forde also issues instruction - prepare for production of new improved model of Owen, for the production of 9mm ammunition, and to cease production of .38" ammunition
30 Oct 1941	Lysaghts receive minutes of conference held on 23 October at Ordnance Production Directorate in Melbourne which were biased and incorrect. and effectively gave the Army full control of the project.	
30 Oct 1941	Lysaght received on order for 2 trial model 9mm guns	
2 Nov 1941	Daily Telegraph launches book - You Me and the War	Section dealing with industry - Do We Make the Best Use of Our Brains includes what was to become the commonly accepted story of the development and production of the Owen [and hindrance by the Army]
5 Nov 1941	Lysaght wrote to OPD saying they now assumed the drawings did not need altering. The OPD did not reply but sent final drawings that had major alterations and many mistakes in design and drawing	

5 Nov 1941	Owen gun was now a very public issue - criticising the Army's obstructionism	Daily Telegraph article Owen Gun Holdup to End
Nov 1941	OPD representatives Barker and Roberts came to Lysaghts. When asked where the order for the 2000 guns was Barker advised he had signed off on the order some 3 weeks ago	
Nov 1941	Daily Telegraph editorial castigates the Army re dithering and not complying with the Minister's directive	
Nov 1941	Minister Forde sent Owen a Bren gun and ammunition to study following complaints from the Middle East that it was malfunctioning in the sand in the hope that Owen could design out the problem	
7 Nov 1941	Lysaghts asks Ministry of Munitions for details of the order to manufacture the guns. They were told the Dept had received the order on 22 October but advised that the calibre, ammunition and other modifications would be defined later and they had done nothing.	
7 Nov 1941	Lysaghts wrote to Forde advising him despite his earlier intervention nothing had changed	
10 Nov 1941	Lysaghts were advised by the OPD that its revised drawings for manufacture were complete and sealed. These drawings contained many design alterations - including many more parts, and the likelihood was that if made to the drawings the guns would not work.	Again an example of the Army considered it knew better than Lysaghts and the Minister and were determined to stop the Owen not getting into manufacture
14 Nov 1941	Lysaghts apply for machinery needed to produce 500 Owen guns per week. So there was no room for argument [by the Army] the directive was accompanied by an explicit minute as to what was required and this was further clarified by Forde on 4 November	List was increased by the OPD but Dept of Munitions said they could not justify the allocation of machinery. In doing this the Army disregarded the directive of the War Cabinet and placed the Lysaght request well down on the priority list. Lysaghts privately purchased some of the machinery to allow a start on production
19 Nov 41	Telegraph article Gun Delay Probe Soon	Two George Finney poignant cartoons
21 Nov 1941	Daily Telegraph published a full page history of the Owen Gun telling the whole sorry tale from the Army's initial rejection of the gun to its indecision and obstructionism regarding calibre and, finally, its unnecessary 'redesign'	Follow up from earlier investigative article Gun Delay Probe Soon
24 Nov 1941	Compulsory conference called of parties by Minister Forde in Melbourne with the purpose of finalising the Owen design so mass production could be rapidly commenced. The Army presented a redesign of the Owen.	Further delays will be paid for in Australian lives. The meeting was a demonstration of Lysaght competence and the Army's incompetence. All design changes proposed by the Army were shown to be either mistakes or contrary to successfully proven designs.
7 December	Japan attacks US Pearl Harbour	US enters the war on side of the Allies
8 Nov 1941	Production drawings for the modified 9mm Owen as tested completed by OPD.	Lysaghts asked OPD to confirm no alterations had been made to Lysaght submitted drawings.
22 Dec 1941	Further trials Sten Mark II, Thompson, German MP40, Owen 9mm	Filmed. Again the Owen proves superior to the other three.
6 Jan 1942	Film screened. Censored by Army on grounds it could cause a lack of confidence in the weapons then in use	
13 Jan 1942	Daily Telegraph again on the case - Slow Work on Owen Gun- because of failure to deliver promised required machine tools	Also discovered despite being directed to do so by the War Cabinet the Army had not ordered the Owen gun to be rushed into mass production.
Jan 1942	First Owen SMGs delivered	
Feb 1942	British testing of SMGs resulted in the Owen being superior to all.	
15 Feb 1942	Singapore falls to the Japanese.	
19 Feb 1942	Darwin bombed by Japanese.	
22 Feb 1942	Govt Special Investigation highlights causes of delays to manufacture of Owen gun.	Prompts release of necessary machine tools.
10 Mar 1942	Essington Lewis calls conference to discuss SMGs.	Army revises need from 10,000 to 100,000 and they were needed ASAP.
6 Apr 1942	Milford transferred from MGO to command AIF 5th Division.	His replacement was a much more amenable person. Ironically the 5th Division went to New Guinea
30 Apr 1942	Japanese invade Australian Territory – Rabaul.	
16 May 1942	Army tests the Austen - numerous failures.	Tests not as rigorous as the Long Bay tests.

4 Jun 1942	Sea Battle of the Midway.	
21 May 1942	Owen lodged completed specifications for Patent 116434.	
June 1942	Lysaghts finally have enough machinery for full production of 2000 guns in a month. Endurance testing carried out	
	Lysaghts later conducted its own tests - the Owen cocked and fired 3,000,000 times without problems	Little wear in moving parts.
8 June 1942	Owen represented Lysaghts at a gun test in Melbourne under the direction of Army Inspector of Small Arms Owen, Bren, Thompson, Austen and 303 rifle were included in test involving mud. Owen found to be superior to all others by a US comparative study.	Object was to determine the endurance of the Austen which had been allowed to go into mass production without any testing at all. Owen proved superior weapon but the Army report was biased and made no mention of the many failures of the Austen.
Jun 1942	Major Hall Deputy Assistant Director of Armament advises production of Austen should cease. Reported the US 32 Division had trialled the Owen, Austen and Thompson and had rated them in that order	
July 1942	First 2000 Owen guns delivered.	
Aug 1942	Output of Owens reached the authorised target level.	This was when Australia faced the chance of being materially isolated from her allies at any time and possible invasion by the Japanese
Sep/Oct 42	Owen MkII 9mm designed by G Wardell.	Aim was to reduce weight
Oct 1942	New Guinea 16th Australian Infantry tested the Owen.	Owen was highly praised
	CO New Guinea recommends that 100 guns be sent to Port Moresby and 1000 guns to Milne Bay and recommends no further shipments of Thompsons be made.	
19 Oct 1942	DCGS suggests that Own guns be sent to forward areas	
Oct 1942	2/2 AIF Battalion engages with Japanese at Templeton's Crossing using Owen guns.	First known use in action.
2-6 Jan 1943	Comparative testing of Owen MkII and OPD version of Owen with Austen barrel.	Lysaght design preferred.
13 Feb 1943	General Instruction decrees that all units New Guinea bound to be supplied with Owen guns	Follow up from Lieutenant- General Mackay
Feb 1943	200 Owen Mark II ordered	
19 Feb 1943	Thomas Blamey Commander-in-Chief Australian Military Forces and Commander-in-Chief Allied Land Forces [South West Pacific Area] issues directive that the Owen SMG contract with Lysaghts be cancelled and that no further Owens be made and that the Australian armed forces would now be equipped with Austens.	
Apr 1943	Production of the Owen peaked at 2,700/ month	32 Months of production, 45,479 guns, 500,000 magazines, 600,000 component spares. Springhill 83 women, 30 men. Newcastle 25 men 3 women
Apr 1943	22,000 Owen guns have been delivered. Owen is officially declared 'The Standard Submachine Gun for the Australian Army'. User report on the Austen completed by New Guinea troops - Austen rejected by them.	
6 Apr 1943	V Wardell briefed Prime Minister Curtin on the whole Owen history and Curtin promises to give the production of the Owen his full support.	There are six typescript pages of notes of the meeting
May 1943	In use by Australian forces in New Guinea the soldiers favoured the Owen over the Austen.	General Blamey would not admit he had made an error in supporting the Austen.
May 43	Report on Owens and Austens based on extensive use by field soldiers prepared - 188 guns of each type used in six different locations in Australia and New Guinea	The Owen was the favoured gun.
Jun 1943	Orders for the Owen were about to run out. Curtin directed an order for another 10,000 guns be placed.	
August 1943	Patent for the 9mm Owen is granted.	
6 Aug 1943	Major Hall's report recommends production of the Austen cease.	
August 1943	Target production of 2000 Owen guns per month reached. Allied forces losing ground in New Guinea to the Japanese.	
23 Sep 1943	General Blamey moves to Port Moresby, New Guinea. The push back up the Kokoda Track commences. Japanese forces being withdrawn from New Guinea	

Dec 1943	British Army competitively tests Owen against Sten, Thompson and Sterling in UK	Owen is shown to be the best performer.
Dec 1943	Owen gun is tested by the Ordnance Board of Britain against five other SMGs. Again the Owen proved to be the superior weapon.	
March 1944	G Wardell writes up Notes for Future Development of the Owen Gun.	Disregarded by the Authorities.
6 Aug 1945	Atomic bomb dropped on Hiroshima.	
Aug 1944	General Northcott Chief of the General Staff issues an instruction that forces in New Guinea only be issued with Owens.	
Sept 1944	Owen production ceases.	
15 Aug 1945	Japan surrenders.	
1 Apr 1949	Evelyn Owen dies.	

The Owen Gun Story

Evelyn Owen, developed his first automatic weapon [Model 1], chambered for .22"LR calibre cartridge, and in mid 1939 offered it to the Australian Army. This weapon was a strange-looking revolver-type weapon with a fixed 'cylinder' in lieu of a magazine, and a thumb-operated trigger. Understandably it was rejected by the Army who, in line with the British Army view of the day, saw no use for a submachine gun as a fighting weapon and Owen's SMG in particular.

The most crucial turn in the Owen gun story shortly before deploying for military service, Owen had carelessly left his Model 1 prototype gun in a sugar bag outside his home near the entrance to his neighbor's flat where it was fortuitously noticed by his neighbour Vincent Wardell the manager of Lysaght Newcastle Works - Port Kembla Branch. An annoyed Wardell invited Owen to explain his ideas to him and was drawn to the opinion that the gun must be looked at further and referred it to an acquaintance Essington Lewis then Director - General of Munitions [who was responsible to the Prime Minister alone for controlling the production of all ordnance, explosives, ammunition, small arms and all machinery and tools used in production of such munitions. and later aircraft and vehicles], for urgent evaluation.

Lewis responded to Wardell's request by arranging for Owen to be transferred to the newly created tri-service Central Inventions Board in Melbourne in September 1940 to allow further work on the gun to proceed

Having seen Owen's gun demonstrated, the Board Secretary, Captain Cecil Dyer realised the military potential of its mechanism, [the Battle of France having been recently lost, and Britain's ability to prevent German invasion in serious doubt. Also Britain had lost most of its small arms at Dunkirk]. However the Inventions Board was not prepared to produce a working gun. Dyer suggested that Lysaghts be asked to manufacture the gun, but his suggestion was summarily rejected. Dyer took the next step and privately asked Lysaghts, following which on their own initiative they offered to make a test gun.

Owen returned to Wollongong at Dyer's direction to develop an improved centre-fire version.

At Lysaghts Owen produced his next design, a somewhat more potent [but still relatively mild] SMG chambered for .32"ACP/ 7.65x17 Browning cartridge [Model 2]. This SMG was a more conventional weapon; now with a traditional trigger, dual pistol grips and a detachable box magazine that was inserted under the receiver and inclined rearward to the left [as seen by the user]. By 1941, Owen produced several more prototypes, chambered for .45ACP calibre, 9mm Luger calibre and even .38" calibre Special revolver cartridge. These prototype guns were built at Lysaght's Newcastle Works Port Kembla Branch - Springhill Works. Owen left for his overseas deployment, and further development of the gun was undertaken by Vincent's brother Gerard Wardell who was Lysaght Chief Engineer, and a Lysaght fitter Freddie Kunzler, who had been trained as a gunsmith in his native Switzerland.

Around this time Essington Lewis intervened by arranging for Evelyn Owen to be recalled from Army field duty and assigned to work with Gerard Wardell on the gun's development,

This was not to be the last time that Lewis was to play a role in overcoming many of the obstacles put in place by the Army and others who sought to stop or delay the production of the Owen. His influence was to have a significant bearing on the story of the development of the Owen gun.

Comment: While Lewis did not directly confront those of the senior military officers who opposed or hindered the production and distribution of the Owen gun, the imprint of his intervention was clearly there.

Gerard Wardell felt that the continued surveillance of the Director General of Munitions Essington Lewis was responsible for overcoming many of these on-going problems deliberately created by the Army.] Ref 1,5

Lewis was kept informed by Vincent Wardell of how things were going along on a regular basis and especially in times of crisis.

To bring matters to a head on 5 April 1943 Vincent Wardell wrote to the Prime Minister setting out the problems that had been encountered by the procrastination of senior Army officers. Curtain invited Vincent to Canberra and from then on with those offending officers being reassigned to other duties the problems from these area largely went away.

In 1940 the Australian Army officialdom was anticipating the adoption of the Sten gun plans and models which had been promised to them by the British government^{(12),(13)}. The Sten was purported to be a much better gun than experience would eventually show, and the establishment didn't want to muddy the waters with competing designs with no provenance. In what appears to be an effort to scuttle the Owen, the Army's Master-General of the Ordnance told Lysaght to provide a sample gun for testing, chambered for .38" calibre Smith and Weston pistol [neither ammunition nor a barrel was to be provided for Lysaght use]. The view of many is that by specifying a rimmed cartridge already knowing that for technical reasons rimmed ammunition had never been used in any other SMG design, this would stump the Lysaght team and the Owen would be progressed no further.

Comment:

From here on, to get the Owen accepted by the military, both the Wardells waged a campaign to overcome the Army's continuing obstructionism.

Vincent sought the help of the press - principally the Daily Telegraph, to gain public support and kept the Prime Minister, the Minister for the Army [and indirectly the War Cabinet], friendly civilian and military personnel and Essington Lewis, informed of events and progress by way of correspondence and meetings.

At meetings with the Ordnance Production Department and other Army personnel convened to discuss design issues. Gerard Wardell with Owen's help successfully countered the Army's claims and overcame the Army's ill-advised technical challenges.

Surprisingly, so intent were some of the senior Army officers on preventing the production of the Owen that they were prepared to ignore the directions of the Minister and the War Cabinet.

Lysaghts sidestepped the choice of .38" calibre and elected to make the new variant to accept .32"ACP calibre instead for which a suitable barrel and ammunition were more easily obtainable. This prototype was shown to the Army in January 30, 1940 – after just 3 weeks of development. It fired effectively and reliably. However the Army requested a 10,000-round endurance test to further test its potential but was unable to supply any ammunition for the test, and in wartime Australia that quantity was effectively impossible for Lysaghts to privately acquire. So Lysaghts made a variant on the same principles but to chamber a .45 ACP calibre cartridge having been assured by the Army that plenty of ammunition would be available for testing, as this was the standard cartridge for the Thompson SMG the Army was importing. But, when the ammunition arrived at the factory, it was found to be .455 Webley pistol ammunition instead – so they retrofitted the gun using a section of old Martini-Henry rifle barrel that had a bore suitable for this calibre ammunition.

Right from July 1939 until around March 1942. The Army strongly resisted development, manufacture and adoption of the Owen Gun; it was only through Vincent Wardell's persistence and willingness to engage in technical discussions with the Director-General of Munitions, court politicians and to keep Essington Lewis and the press informed that the gun finally came to be accepted by the military hierarchy. The Owen had passed mud and dirt testing with exceptional results in both .455" Webley and .38" S&W variant [the first 100-gun order was again required to be in .38" S&W by the Army]. Only in early September 1941 was a 9mm version authorized, and this by a civilian official tired of Army obstructions.

The turning point for the Owen was a competitive trial at the end of September 1941, in which it [in both 9mm Parabellum and .45"ACP] was pitted against a newly-arrived Sten and a Thompson. The Thompson did well when clean but failed when dirty, and the Sten quickly failed in sand and mud tests. The Owen passed with flying colours, in both calibres. This led to an order for 2,000 9mm Owen guns for field trials, and the sending of Owen gun samples and drawings to England, with the suggestion that the Sten be discontinued in favour of it [in a 1943 British test, the Owen beat all comers, including the Austen, Sten, and Sterling].

12. Before the war the Australian Army had no significant core of technical officers and what they did have, had been trained by Britain, consequently they had a British Army mindset.

13. The Sten was a newly developed weapon based on a German MP40 that was captured at Dunkirk; it had its first testing in January 1941.

In 1943 the US army also had carried out tests on the Owen against the Austen and the Thompson and considered the Owen the superior weapon.

Following extensive comparative testing, the Owen SMG went into production in late 1941 after receiving an order for 2000 guns and was finally adopted by the Australian Army in 1942. The Owen was manufactured until September 1944 in three basic versions, Mark 1-42, Mark 1-43 [or Mark 1 Wood butt], and Mark 2.

In all 45,433 Owen SMGs were made by Lysaghts under contract to the Army. The Owen SMG remained in service with the Australian forces up until the 1960s - through World War 2, the Korean war, the Malayan insurgency and the Viet Nam war.

Patents

Evelyn Owen did not worry about obtaining patents for his invention but when encouraged to do so by V Wardell in 1941 he lodged a patent on 26 March 1942 and Australian patent number 115,974 was awarded to him on 18 February 1943.

Royalties

It was not until after the war when the patent was sold to the Australian government that he received any payment for his patent and any royalties for the manufacture of his invention. In all he received only \$12,900 [£6,450] after tax from the Australian government.

John Lysaght [Australia] Limited [Lysaghts]

Lysaghts initially had no intention of manufacturing the Owen gun as it was not their core business - the manufacture of steel sheet and galvanized products. They saw their role as being that of developing Owens design to the stage of having a workable SMG and thus assisting the Army Inventions Board to have the Owen project commenced.

Concerned by the continuous obstruction by the Army to prevent the Owen being placed in the hands of Australian soldiers and having established the superior performance of the Owen in comparison with the Sten/ Austen and Thompson and coupled with the fear that Australia would become isolated from her allies and forced to be truly self-sufficient - including in the area of armaments, Vincent Wardell investigated the question of full scale production with his brother, and found that production was likely to be both easy and cheap.

Lysaght began the Owen gun project as a patriotic endeavor and funded the initial development work. As it turned out in the wash up Lysaghts made only 1.5% profit on the project.

Appendix 3 Photos of the Owen Gun and other sub machine guns

(Image removed)

Owen Submachine Gun Mark I - skeleton steel stock

(Image removed)

Owen Submachine Gun Mark I - disassembled

(Image removed)

Owen 32ACP prototype submachine gun (1940)

Source: <http://www.forgottenweapons.com/wp-content/uploads/2013/03/Owen-diagram.jpg>

Thompson sub machine gun circa 1940

Source *A Rough Guide of the costs of guns during WW2* www.warhistoryonline.com/wp-content/uploads/2015/03/wajZf.jpg

(Image removed)

The Thompson SMG was adopted by the US military in 1938. The M1928A1 had provision for box and drum magazines. It had a Cutts compensator, cooling fins on the barrel, employed a delayed blowback option and its charging handle was located on the top of the receiver.

The M1 and M1A1A1 variant had a barrel without cooling fins, a simplified rear sight, provision for only box magazines, employed a straight blowback option and the charging handle was on the side of the receiver

(Image removed)

The American M3 [Grease Gun]

Source: www.warhistoryonline.com/wp-content/uploads/2015/03/wajZf.jpg

The American M3 [Grease Gun] was adopted for the US Army service in 1943 to replace the .45 calibre Thompson in front-line service. The gun used metal stamping and pressing, spot welding and seam welding extensively in its construction. Only the barrel, bolt and firing mechanism were precision machined. It was chambered for the same .45 ammunition fired by the Thompson SMG, and was cheaper [A\$22] to produce, lighter and more accurate than its predecessor.

(Image removed)

British STEN Mk.II submachine gun

The Sten was the most widely used SMG in the European and North African war theatres. Its simple design and low production cost made it an effective insurgency weapons for resistance groups. Over two million were produced.

(Image removed)

AUSTEN submachine gun.

Source: world.guns.ru/smg/austr/austen-e.html

Austen [Australian Sten] SMG was an Australian development based on the British Sten with some features copied from the German MP40. The Australian Army favoured its development ahead of the Owen until it was shown in extreme environmental conditions of jungle warfare in New Guinea it lacked the performance and reliability of the Owen. Following this assessment it was withdrawn from service.

(Image removed)

MP-40 submachine gun, with shoulder stock folded

The German MP 40 submachine gun was an open-bolt blowback operated weapon. Fully automatic fire was the only setting, but the relatively low rate of fire allowed for single shots with controlled trigger pulls. The bolt featured a telescoping return spring guide which served as a recoil spring buffer. The cocking handle was permanently attached to the bolt.

Weight and Ammunition Comparison

	Owen	Austen	Thompson	MP40
SMG plus 11 loaded magazines	11.97kg	11.30kg	13.30kg	11.73kg
Total number of rounds	363	308	220	363

Source Ref 7 p72

Comparison of Bullet weights	.32"	71 grains
	.38" Mark II	178 grains
	.45"	230 grains
	9mm	124 grains

Source Ref 7 p29

WORLD WAR 2 Submachine Guns COMPARISON TABLE								
Weapon			Owen	Sten	Austen	Thompson	M3	MP40
Origin			Australia	UK	Australia	US	US	Germany
Model			Mark 2	Mark 2	Mark 1	M1	M3	MP40
Mass	kg	<i>unloaded</i>	4.21	3.26	3.98	4.9	3.70	3.97
Length	mm	<i>extended</i>	820	792	860	850	760	833
	mm	<i>folded</i>	-		552	-	579	630
Stock/ Butt construction			<i>Mk1-42 Fixed skeleton steelframe Mk 1 Fixed Wood</i>	Fixed skeleton shoulder stock?	Fixed shoulder stock	Fixed wooden stock	Sliding one piece wire stock	Folding shoulder stock
Length of barrel	mm		247	196	198	270	203	251
Calibre	mm		9	9	9	11.42	9	9
Cartridge	mm		9 x 19 <i>parabellum</i>	9x19 <i>parabellum</i>	9x19 <i>parabellum</i>	11.43x23	9 x 19 <i>parabellum</i>	9x19 <i>parabellum</i>
Action			Blowback operated open bolt, fixed firing pin on face of the bolt	Blowback operated open bolt fixed firing pin on face of the bolt	Blowback operated open bolt fixed firing pin on face of the bolt	Blowback operated with Blish Lock	Blowback,operated open bolt fixed firing pin on face of the bolt	Straight blowback - open bolt fixed firing pin on face of the bolt
Rate of fire	rpm		700	540-575	500	700	450	500-550
Muzzle velocity	m/s		420	366	366	285	280	400
Effective firing range	m		100-200	150-200	100-150?	50	50	100-200
Magazine			Detachable top mounted vertical box -	Detachable side mounted horizontal box -	Detachable side mounted horizontal box -	Detachable bottom mounted vertical box	Detachable bottom mounted vertical box	Detachable bottom mounted box
Magazine capacity - rounds			32	32	30	30	30	32
Round Arrangement			Staggered double column with alternating double feed	Staggered double column with centralized single feed	Staggered double column with centralized single feed	Staggered double column with alternating double feed	Staggered double column with centralized single feed	Staggered double column with centralized single feed
Sights			Fixed aperture 100 yards rear, adjustable post front	Fixed aperture 100 yards rear, adjustable post front	Adj windage aperture 100 yards rear adjustable front	Aperture 50 yards, flip/adj leaf to 600 yards rear, barley corn on fixed block front		
Cost to manufacture/ supply	1942	A\$ equiv	A\$28.50	A\$10	A\$24 & A\$32*	A\$200]	A\$22	\$24
Estimated numbers used by Australian forces			~46,000			23,000		
Estimated Number manufactured between 1941-45			~46,000	~2,000,000	~20,000	~1.75 million	600,000	~1.1 million

* The Austen was manufactured by two firms most at the higher unit cost

Appendix 4 Drawings of the Owen Gun

(Image removed)

Coloured instructional drawing of a sectioned Owen sub-machine gun with named parts. Design patented 22 July 1941. Published by Lysaghts Newcastle Works Pty Ltd, Port Kembla Branch.

Appendix 5 Owen Gun Technical Information

Characteristics

Design:	1939
Place of origin:	Australia
Number Built:	~45,000
Weight:	4.6kg (10lb) unloaded
Overall Length:	820 mm (32in)
Barrel Length:	247mm (9.75in)
Cartridge:	9 mm x 19mm Parabellum
Calibre:	9 mm
Action:	Blowback
Rate of Fire:	700 round/min
Muzzle Velocity:	420m/sec (1250 ft/sec)
Feed System:	32 round detachable box magazine
Effective Range	100-200 metres

Modifications and Variants

The Owen went through several changes, although the basic mechanism remained the same throughout production. The main goal of the changes was to reduce the weight of the gun, with a reduction of more than a full pound [0.454kg] being achieved. Guns made during WW2 were painted with a camouflage scheme of green and yellow for jungle use, which is often seen on guns today. After the war, guns that were arsenal refurbished, had the paint stripped off and were parkerized (see Glossary).

The two main versions are the Mk1 (roughly 12,000 made) and Mk1* (roughly 33,000 made). A MkII version was designed, but only a few hundred were made. In theory, parts between all the Mk1 and Mk1* guns are interchangeable, although factory quality control was not always tight enough to make this true for the closely fitted parts like the barrels. Over the course of war use and the two following decades of official adoption, many existing Owen guns had a mixture of parts from different official types.

The main parts that were changed were the trigger housing, barrel, and stock.

The early barrels were heavy and finned to aid cooling. Over the course of production they were lightened and the fins discarded. The slotted muzzle compensator remained a feature of all versions.

Trigger housings began as solid units, and were later lightened with cutouts to remove unnecessary material.

The original stock design was bent strip steel and later included a clip to hold an oil bottle. The majority of Owens were made with wooden stocks both solid and with lightening cuts and both with and without traps to hold cleaning equipment.

The Owen submachine gun was a simple weapon - it was little more than a barrel, a bolt and a spring featuring:

- a tubular receiver that received the bolt which incorporated a firing pin. Its lower portion was "hollowed out" to accept a simple pistol grip, the trigger unit.
- a removable barrel assembly.
- a steel strip skeletal frame steel stock. Later variants had a wooden stock and others had a "mutt" design featuring both wood and a metal frame]

- a detachable box magazine which fed 32 x 9mm cartridges in succession. The magazine feed was set on the forward upper end of the tubular receiver and the 32 rounds were fed successively into the chamber by a vertical spring. [This arrangement made for a reliable feed mechanism assisted by both the magazine spring and gravity.]
- a forward pistol grip for a firm two-point hold and this further showcased finger grooves for basic ergonomics.
- a barrel designed to be "quick-changing" which prevented overheating under heavy sustained fire conditions - a design quality more akin to light machine guns than submachine guns. [The early variant of the Owen incorporated cooling fins at the base near the receiver. This design element was later dropped.]
- a "blowback" firing action that utilised an open bolt. The internal compartmentalized arrangement of the receiver was such that it kept the integral components clear of debris that would have otherwise impeded the function.
- an overall mass of about 9lbs [4.21kg], a 32 inch [820mm] running length and a 10 inch [247mm] barrel assembly.
- a rate-of-fire was of ~700 rounds per minute with a muzzle velocity of 1,380 feet per second [420m/s] and an effective range out to 200m.

The simplicity of its design ensured that it could be mass produced.

As a consequence of its design it was robust, inherently reliable and required little training to operate it effectively.

In August 1946 the Army changed the designation of the various Owen models:

Owen Model	Description
Mark 1	The original prototype model with the cocking handle on the top of the gun, a fixed wooden butt and the Mark I barrel
Mark 1/1	The Mark I Owen with a Mark II barrel and a 10 inch bayonet
Mark 1/2	The Mark 1 with a Mark III barrel
Mark 2	The original Lysaght Mark 1 and Mark 1 lightened with detachable butts and Mark 1 barrels
Mark 2/1	The Mark 2 with the Mark II barrel and 10inch bayonet
Mark 2/2	The Mark 2 with the Mark III barrel and 8 inch bayonet
Mark 2/3	The Mark 2/2 with any of the barrels and appropriate bayonet [usually 10 inch] and refurbished at the Lithgow Small Arms Factory, during which process a new safety catch was added to the rear of the gun
Mark 3	The Lysaght Mark III
Mark 4	An Army design based on the Mark 3 but with a different barrel fixture and rear pistol grip

Approximately 12,000 Owen guns were made with a solid trigger frame and around 33,000 with a skeletonised trigger frame.

Most of the solid frame models were made in 1942 and most of the skeletonised ones were made in 1943 and 1944

Owen Gun Orders

16 06 41	100 guns	[.38" and some .45"]
30 11 41	2 guns	[trial models in 9mm calibre]
20 11 41	2000 guns	[the first order of 9mm]
03 03 42	17900 guns	[Mark I]
06 10 42	10,000 guns	[Mark 1]
26 10 42	2 guns	[Mark II prototypes]
13 11 42	8 guns	[Navy order Mark I]
07 01 43	250 guns	[Navy order Mark I]
16 02 43	200 guns	[Mark II for trials]
13 05 43	5000 guns	[Mark I]
12 10 43	1 gun	[magazine underneath]
13 10 43	10000 guns	[Mark I RAAF order]
04 10 44	6 guns	[Mark I]
	10 guns	[Mark II]
	Total	45, 479

Source: Ref 7 page 106

Lysaght Owen Gun Component Subcontractors

Component	Subcontractor
Barrels	Hastings Deering - Sydney [Early barrels were made by Howard Auto Cultivators]
Bodies	British Tube Mills Ltd - Adelaide
Butts [steel]	Henry Lane Ltd - Newcastle
Butts [timber]	Ricketts & Thorpe Ltd - Sydney
Magazines and Pressings	Henry Lane Ltd - Newcastle
Screws	Nettlefolds Pty Ltd
Sling swivels and mounts	Henry Lane Ltd - Newcastle
Springs [except magazine]	Fletcher Springs Ltd - Sydney
Hand grips	W J Manufacturing Ltd - Sydney

Source Ref 7 page 107

Costs and Manhours

Owen [complete]	£14:5:0	21.2 manhours
Austen [complete]	£12:0:0 [Die Casters]	18.1 manhours
	£16:3:0 [Carmichaels]	23.4 manhours

Production Tooling Costs

Owen	£0:7:6 per gun	[40,462 guns]
Austen [Die Casters]	£1:19:2 per gun	[10,204 guns]
[Carmichaels]	£1:14:8 per gun	[10,000 guns]

Source Ref 7 page 87 War Cabinet Addendum 175/1945

Lysaght Springhill Employees Involved

At the peak of production at Springhill over 100 people were involved - mainly women.

Lithgow Small Arms Factory

After the war the guns that were held in Australia were Factory Thoroughly Repaired [FTR] at Lithgow and had their camouflage paint removed and were Parkerised. They were also fitted

with a sliding safety piece that blocked the cocking handle from moving by sliding either in front of, or behind the cocking handle, blocking the handle's movement in its slot.

Appendix 6 People and Industry Associated with the Owen Submachine Gun
Evelyn Owen, Essington Lewis, Gerald. S. Wardell, Vincent A Wardell,

Evelyn Owen [1915-1949]



Evelyn Owen – photographer unknown

'Inventor' of the Owen sub-machine gun, Evelyn Owen was born on 15 May 1915 in Wollongong, New South Wales. Despite the considerable efforts of his parents to steer him towards less dangerous pursuits, the young Owen was obsessed with guns; with making them, modifying them and firing them. At the age of eight he began his experiments by building his own shotguns from which he would fire stones at rubbish heaps. Over the ensuing years Owen pursued his hobby with great passion. At one stage he transferred his interest to bomb making, once being wounded in the stomach by shrapnel from one of his explosives. On another occasion he shot himself in the stomach while trying out a new kind of bolt in an old rifle. He then turned his interest to sub-machine guns, making each of the prototypes himself, having learned metal and lathe work in the workshop of a family friend.



The weapon that would eventually bear his name, the Owen sub-machine gun, had its genesis in 1931, but he did not perfect his concept design until 1938. Repeated testing proved that little could jam or interrupt the gun's rate of fire, making it superior to the Thompson gun. But the following year when he attempted to interest the military, Owen was rebuffed, being told that neither the Australian or British armies had any need for such a weapon.

Owen enlisted in the AIF in May 1940 but, just before embarking for the Middle East with his unit, he managed to interest the manager of the Port Kembla plant of Lysaght's Newcastle Works, Vincent A. Wardell, in the gun. Wardell spoke to Sir Percy Spender, Minister for the Army, who had Owen transferred to the Central Inventions Board.

In June of 1941 Owen was discharged from the AIF to work at Lysaght with Lysaght Chief Engineer Gerard Wardell and trained gunsmith Fred Kunzler to further develop his design into one that could be easily manufactured.

By late 1942 the Owen was being used in jungle fighting against the Japanese in South-west Pacific war theatre.

More than 45,000 Owen guns were produced during the Second World War and they continued in use during the Korean War, the Malayan Emergency and in the early years of the Vietnam War. Owen received £10,000 in royalties. Owen died in Wollongong on 1 April 1949 at the age of 33.

[Sir] Essington Lewis [1881-1961]

Essington Lewis industrialist and wartime director of munitions, graduated from the South Australian School of Mining as a mining engineer and later signed on with the Broken Hill Proprietary Co. Ltd at Broken Hill, New South Wales.

A mastery of detail and versatility saw him promoted to Port Pirie and later Iron Knob to expand production of ironstone in production management positions and later to the newly created Newcastle steelworks where he rose to be Managing Director and the first BHP. executive officer to take a seat on the board.

On his way to Europe and U.S.A., Lewis visited Japan and was disturbed to learn of the swift expansion of the Japanese steel and other strategic industries and saw the predicament Australia was in. He believed that BHP could build ships at Walsh Island at Newcastle and could co-operate with other companies to build aircraft, armament and munitions and made it happen.

During World War 2 Lewis wielded enormous power. He was already business consultant to the Department of Defence when (Sir) Robert Menzies in May 1940 offered him the position of Director of Munitions. The unlimited authority Lewis promptly assumed made him in fact an 'industrial dictator'. As permanent head of the new Department of Munitions he controlled the production of all ordnance, explosives, ammunition, small arms, aircraft and vehicles and all machinery and tools used in producing such munitions. He was given a seat on the Defence Committee and had the same access to War Cabinet as the chiefs of staff. Unlike them he was exempt from the rules that regulated officers of the Crown, in particular the Public Service Act (1922). Lewis was empowered to acquire compulsorily any materials or building which he needed; he could issue contracts with private firms without calling tenders; he could spend up to £250,000 on any project without approval and he could delegate and revoke responsibilities at will.

After Menzies' resignation Lewis had to deal with a Labor ministry. But there was no curtailment of his authority. Rather, Prime Minister John Curtin increased Lewis's power by appointing him Director-General of the additional Department of Aircraft Production. In this capacity Lewis hastened the output of Beauforts to replace the outmoded Wirraways, and after the Japanese bombing of Darwin on 19 February 1942 he organized the production of the new Boomerangs.

The range of munitions produced by Lewis was astonishing in its variety and versatility. His factories made grenades, land-mines, ammunition of all types, 303 rifles, machine-and sub-machine guns, including the Owen gun, and several types of heavy guns. Sophisticated optical aids were produced. Post-war critics condemned the ambitious manufacture of, as it turned out, unused tanks and torpedoes, but Lewis, without the benefit of hindsight, planned for all contingencies. Much of Australia's industrial expansion after the war was based on wartime techniques which he introduced.

Lewis had not sought honours but many came to him. In 1940 he received the bronze medal of the Australasian Institute of Mining and Metallurgy; in 1942 he was made an honorary member of the American Institute of Mining and Metallurgical Engineers; he was awarded the Kernot medal by the University of Melbourne in 1943 and the Bessemer gold medal by the Iron and Steel Institute, London, next year. He refused recommendation for a knighthood, but Curtin, lavish in his praise and diverging from party policy, initiated Lewis's appointment in 1943 as Companion of Honour.

By mid-1944 Lewis's main war tasks were over. He resigned his government appointments on 28 May and was once again the steel-master.

Expansion and efficiency continued to be his goals for BHP. He led in mechanizing the coal-mining industry; he opened new ironstone quarries at the back of Whyalla and a second source of iron ore at Yampi Sound, Western Australia; from 1948 he began developing a tinsplate industry at Port Kembla. After Darling's death in January 1950 he rejoined the board and became chairman, stepping down to deputy chairman in July 1952. His influence permeated important projects outside BHP., including General Motors-Holden's first all-Australian cars in 1948, the long-range weapons project at Salisbury and Woomera, South Australia, in 1946..

Among Lewis's papers was found the simple text which had ruled his life: **I am work**. By following this precept he had made BHP. one of the most efficient steel companies in the world, and his influence was felt in every industry and occupation His work in munitions was a prerequisite for many of the complex manufacturing ventures developed in Australia in the 1940s and 1950s. There can be little doubt that but for his premonition of war in the 1930s and

his rare talents and dedication as an organizer during the war, Australia would have played a lesser part in fighting the Japanese in the Pacific.

Source: Australian Dictionary of Biography

Fred Kunzler [1906-1980]

Kunzler had trained as a gunsmith in Switzerland. He emigrated to Australia in 1927 and spent most of his working life at Lysaghts at Port Kembla as a fitter and turner. He worked in conjunction with Evelyn Owen and Gerard Wardell on the design of the Owen gun in particular the trigger layout.

Gerard Wardell - nickname 'Bones' [1904-1992]



Lysaght Springhill Chief Engineer Gerard S Wardell with a 9mm Owen Gun

Gerard Wardell was born at the Royal Mint in Melbourne the son of the then Assistant Master of the Mint. He graduated from Castlemaine Technical College with a Diploma of Mechanical and Electrical Engineering in 1926 and joined the well known firm of Thompson Engineering and Pipe Co of Castlemaine in 1927 as a draftsman. In his spare time he was an active member of the Australian Citizen Military Forces, and rose to the rank of Captain in 1928 in the 7th Battalion Machine Gun Company. There he gained experience with Vickers and Lewis.

In 1930 he joined the Electrolytic Zinc Company, Rosebery, Tasmania as a design draftsman. In 1934, he was appointed Surveyor and Engineer for Cocks Pioneer Gold and Tin Mines at Eldorado, Victoria where he was responsible for the ongoing maintenance engineering aspects of the biggest gold dredge in the Southern Hemisphere [at the time].

In 1939 he joined Lysaghts Newcastle Works Pty Ltd at Port Kembla - Springhill Works as Chief Engineer mainly responsible for maintenance of the plant. When in 1947 Commonwealth Rolling Mills (CRM) became wholly owned by Lysaghts Gerard was appointed Chief Development Engineer for both the CRM and Springhill Works and remained in that position until he retired in 1965.

In his time as Chief Development Engineer Gerard Wardell and his team went on to build the following major projects:

- 1951 single stand reversing cold reduction mill at CRM
- 1955 4-stand cold mill, pickle line and 2 shear lines at Springhill
- 1961 No 1 continuous galvanising line at Springhill
- 1964 No 2 continuous galvanising line at Springhill
- 1966 No 3 continuous galvanising line at Springhill

Source: Chris Cullen Eulogy for Gerard Wardell

Vincent Wardell [1903-1990]

Vincent graduated with a Bachelor of Science from University of Melbourne with Honours in 1926 and worked for a short time in Melbourne as a metallurgist. He moved with his brother to Electrolytic Zinc Company, Rosebery, Tasmania in 1930. He left to manage a distillery company in Melbourne.

In 1931 Vincent moved to New South Wales and joined Lysaght's Newcastle Works Pty Ltd as a research superintendent. One of his first tasks was the establishment of its technical department.

By 1939, when Vincent was appointed assistant general manager of Lysaght's Newcastle Works, he had impressed superiors as a quiet but confident achiever. That year Gerard joined Lysaght's Port Kembla as the chief engineer. When Philip Parbury, the works manager, volunteered for the Australian Imperial Force, Vincent became the acting manager at Port Kembla. This confluence of family ties and corporate and technical skills brought unexpected results.

When Vincent Wardell and Evelyn Owen, the inventor of the Owen submachine gun, met in 1940, Vincent's calm, persistent diplomacy and his strategic contacts in government combined with his brother Gerard's technical expertise to see Owen's gun through to production and military use. While the board of John Lysaght Ltd in London knew little of this development, Vincent had the support of the Newcastle works, especially Richard Parry Okeden, its chairman and managing director. Lysaght's, which had commenced production at Port Kembla in 1936, produced galvanised and black sheet-metal. The company was not then an arms manufacturer. Vincent, with his quiet and dedicated approach, and Gerard, the more flamboyant brother, set up an annexe at Port Kembla to manufacture the gun. This required more than technical expertise and machinery.

Sections of the Australian army delayed and obstructed the development of the gun but Vincent drew on his considerable management skills. He met variously with Essington Lewis, the Director-General of Munitions whom he had encountered in Newcastle, (Sir) Percy Spender, (Sir) Arthur Fadden and Frank Forde to see the project through. When the army cancelled the order for production in March 1943 in favour of another weapon, the Austen, Vincent wrote to the prime minister, John Curtin. At their subsequent meeting, Vincent was at his convincing and persuasive best. The order was restored and the gun continued to be made at Port Kembla until production ceased in 1944, by which time more than 45,000 had been manufactured.



Vincent Wardell, by Edward Wardell, 1923
State Library of Victoria, H2008.2/352

Source: Australian Dictionary of Biography

John Lysaght Australia Limited [JLA]

Vincent was appointed manager of Lysaght's Port Kembla Works (soon to be Lysaght's Works Pty Ltd) in 1944. A director of John Lysaght (Australia) Pty Ltd from 1953, he was production director and director responsible for research and development from 1957 to 1970. He served as chairman of Nettlefold's Pty Ltd (1964-67) and with Guest, Keen & Nettlefolds (Aust.) Pty Ltd as chairman and as a member of its international board.

John Lysaght {who was an Irish born civil engineer} bought a small galvanising business in Bristol, England in 1857. He expanded the business quite rapidly and by 1878 his factory was producing over 1000 tons/month of galvanised product notably galvanised corrugated iron. Over the next several years he acquired several other plants and lifted company production to 40,000 tons/year. His largest market was Australia which had entered a period of rapid growth following the influx of migrants attracted by gold discoveries, and the boom in rural industries.

Lysaght visited Australia in 1879 and arranged the establishment of a local subsidiary the Victorian Galvanised Iron and Wire Company, to sell his UK produced product.

As the Australian market was absorbing 75% of his production and fearful that a future Australian government might introduce a protective tariff to assist a local industry, in 1921 he set up a wholly owned subsidiary in Newcastle to produce plain and corrugated galvanised and black iron sheet.

When the World War I was over BHP encouraged satellite industries to set up in Newcastle. In 1921 John Lysaght took up this saw the benefit of building a rolling works alongside the BHP works to produce black and galvanised steel sheet for the Australian market. The feedstock was from the adjacent BHP plant establishing a link which would ultimately see the two companies become one some 50 years later.

During the 1930s the output of the Newcastle plant was lifted to more than 100,000 tons/ year and large as it was, it was insufficient to meet the Australian demand.

To meet this problem, and overcome the threatened removal of protective tariffs Lysaght again became BHP Port Kembla AIS works neighbour when in 1939 it established its second Australian plant, the Springhill Works. Contingent on establishing this plant Lysaghts first entered into an agreement with BHP to purchase its sheet mill and galvanising facility- part of BHP's Port Kembla Works. [The agreement also stipulated that Lysaght would construct a new plant of at least twice the size of the former AIS plant.].

Also in the same year Lysaght formed an equal partnership with American Rolling Mills Company [Armco] to set up the Commonwealth Rolling Mills at Port Kembla [CRM]. The new CRM plant was to meet a strategic demand to provide locally manufactured steel sheet for the Australian automotive and appliance industries. Lysaght was also to develop many special steels at the CRM Works such as electrical and helmet steels and bullet proof plate.

Lysaghts wartime contribution, over and above meeting wartime needs for its established product, was to manufacture Anderson air raid shelters and the Owen submachine gun.

CRM became wholly owned by Lysaghts in 1947 and in conjunction with BHP/AIS Lysaghts made the move to cold strip rolling and built a continuous cold rolling mill .

In 1961 Lysaght expanded both its Works and product range and commissioned its first continuous galvanising line at Port Kembla and began building its network of steel service centres around Australia.

Lysaghts added a second [1964] and third [1966] continuous galvanising line at Springhill.

With BHP and Lysaghts co-located at Port Kembla it was not surprising that in 1969 BHP obtained a half share in John Lysaght Australia. The other half was owned by GKN [Guest Keen and Nettlefold Limited] which had superseded John Lysaght as the British parent company.

Throughout the 1960s Lysaghts introduced special sheet steels including Colorbond pre-painted steel. In 1966 the year that Colorbond was launched, Lysaght closed its Newcastle steel sheet plant, but the following year it obtained agreement from the Victorian government

to set up an integrated steel plant and by 1978 it has commissioned a hot strip mill and continuous galvanising lines focused on supplying the motor vehicle industry in Victoria and South Australia.

BHP bought out the GKN share of Lysaghts in 1979.

Demerged in 2002 BHP Port Kembla steelworks and its Coated Products Division became BlueScope Steel Limited in 2003.

Source: Illawarra Heritage Trail and Chris Cullen

Appendix 7 Glossary and Acronyms

Glossary

Blish system	as opposed to the blowback, employed an arrangement of two sliding wedges to delay the unlocking of the breech until the gas pressure within the barrel and chamber had dropped to a safe level.
blowback	a system of operation for self-loading firearms that obtains energy from the motion of the cartridge case as it is pushed to the rear by expanding gases created by the ignition of the propellant charge.
buttstock	A stock, also known as a shoulder stock, or simply a butt is a part of a firearm, to which the barrel and firing mechanism are attached, that is held against one's shoulder when firing the gun.
magwell	magazine well, is the space into which a detachable magazine fits when it is installed into its firearm.
parabellum	the most common hand gun cartridge in the world and used in most SMGs and pistols to this day.
parkerized	a rust protection method that also provides resistance to wear through the application of a chemical phosphate conversion coating.
receiver	the part of a firearm that houses the operating parts.
recoil compensator	is a device connected to the muzzle of a firearm that redirects propellant gases to counter recoil and unwanted rising of the barrel during rapid fire.
receiver	is the part of a firearm which provides housing for the, bolt, and firing mechanism, and which in the case of the Owen is tapered at its forward end to receive the tapered barrel
rimmed	rimmed cartridges have a rim or extractor flange of larger diameter than the case base, often with a grooved or undercut area immediately ahead of the rim. [Semi-rimmed cartridges have a rim that is only slightly larger in diameter than the base, and usually also a distinct undercut area between the rim and case base. Rimless cartridges have a rim and base of the same diameter although the rim may actually be .001- or .002-inch larger than the base.]
sear	part of the trigger mechanism on a firearm that holds the bolt back until the correct amount of pressure has been applied to the trigger; at which point the bolt is released to discharge the weapon. The sear may be a separate part or can be a surface incorporated into the trigger.

Acronyms

ACP	Automatic Colt Pistol
CP	Colt Pistol
CRM	Commonwealth Rolling Mills a joint venture of USa Armco and John Lysaght Australia
LR	Long Rifle
MGO	Master-General of the Ordnance
OPD	Ordnance Production Directorate

Appendix 8 Author's Assessment of Engineering Heritage Significance of Owen Gun

Historical Significance	Indicate 'Agree' or leave blank	
	National or State heritage significant	Other than National or State heritage significant
Guidelines for inclusion		
Shows evidence of a significant human activity.	Agree	
Is associated with a significant activity or historical phase.	Agree	
Maintains or shows the continuity of a historical process or activity.		
Guidelines for exclusion		
Has incidental or unsubstantiated connections with historically important activities or processes.		
Provides evidence of activities or processes that are of dubious importance.		
Has been so altered that it can no longer provide evidence of a particular association		
Historic Individuals or Association		
Guidelines for inclusion		
<ul style="list-style-type: none"> Shows evidence of a significant human occupation. Is associated with a significant event, person, or group of persons. 	Agree	
Guidelines for exclusion		
<ul style="list-style-type: none"> Has incidental or unsubstantiated connections with historically important people or events. Provides evidence of people or events that are of dubious historical importance Has been so altered that it can no longer provide evidence of particular association. 		
Creative or Technical Achievement		
Guidelines for inclusion		
<ul style="list-style-type: none"> Shows or is associated with, creative or technical innovation or achievement. Is aesthetically distinctive. Has landmark qualities. Exemplifies a particular taste, style, or technology. 	Agree Agree	
Guidelines for exclusion		
<ul style="list-style-type: none"> Is not a major work by an important designer or artist. Has lost its design or technical integrity. Its visual or sensory appeal or landmark qualities have been more than temporarily downgraded. Has only a loose association with a creative or technical achievement. 		

Research Potential		
Guidelines for inclusion		
<ul style="list-style-type: none"> Has the potential to yield new or further substantial scientific and/or archaeological information. 	Agree	
<ul style="list-style-type: none"> Is an important benchmark or reference site or type. 	Agree	
<ul style="list-style-type: none"> Provides evidence of past human cultures that is unavailable. 		
Guidelines for exclusion		
<ul style="list-style-type: none"> Has little archaeological or research potential. Only contains information that is readily available from other resources or archaeological sites. The knowledge gained would be irrelevant to research, human history, or culture. 		
Social		
Guidelines for inclusion		
<ul style="list-style-type: none"> Is important for its association with an identifiable group. Is important to a community's sense of place. 	Agree	
Guidelines for exclusion		
<ul style="list-style-type: none"> Is only important to the community for amenity reasons. 		
Rarity		
Guidelines for inclusion		
<ul style="list-style-type: none"> Provides evidence of a defunct custom, way of life or process. Shows unusually accurate evidence of a significant human activity. Is the only example of its type. 	Agree	
<ul style="list-style-type: none"> Demonstrates designs or techniques of exceptional interest. 	Agree	
<ul style="list-style-type: none"> Shows rare evidence of a significant human activity important. 		
Guidelines for exclusion		
<ul style="list-style-type: none"> Is not rare. Is numerous but under threat. 		
Representativeness		
Guidelines for inclusion		
<ul style="list-style-type: none"> Is a fine example of its type.. Has the principal characteristics of an important class or group of items. Has attributes typical of a particular way of life, philosophy, custom, significant process, design, technique or activity. 	Agree Agree	
<ul style="list-style-type: none"> Is a significant variation to a class of item. Is part of a group which collectively illustrates a representative type. 	Agree	
<ul style="list-style-type: none"> Is outstanding because of its setting, condition or size. 		

<ul style="list-style-type: none"> Is outstanding because of its integrity or the esteem in which it is held. 	Agree	
Guidelines for exclusion		
<ul style="list-style-type: none"> Is a poor example of its type.. 		
<ul style="list-style-type: none"> Does not include or has lost the range of characteristics of a type. Does not represent well the characteristics that make up a significant variation of a type. 		

Extract from the memoirs of Ian Clarke, a soldier who used the Owen gun in New Guinea

In December 1942 a few weeks prior to my 19th birthday I was sent off to a Junior Leaders Course at Balgownie, a mining town on the coast some two hours south of Sydney, near Wollongong. Having gained a fair pass I returned to the Battalion and was immediately promoted to Lance Corporal. Having attained the age of 19 on 6th January 1943 I immediately applied for transfer to the AIF (Australian Infantry Force). In the meantime, while waiting for my transfer to come through, I was sent away again, this time to a Small Arms School at Bonegilla in Victoria, near the Hume Weir. There we received instruction in the use and maintenance of the Thompson SMG (Sub Machine Gun) a most useless weapon, the Sten SMG, the Bren LMG (Light machine gun), the Anti Tank Rifle (another useless weapon) and the Owen SMG, the most ingenious and reliable jungle fighting weapon manufactured up to that time. It fired a 9mm (millimeter) bullet from a 20 round magazine. It saved countless numbers of lives in the New Guinea jungle. It was simplicity itself. It could be buried in mud and still fire, it was light and very maneuverable and there was no bolt locking piece to jam as constantly happened with the Thompson.

I was privileged to fire the 26th Owen to come off the assembly line.